

REMARKS

Reconsideration of this application, based on this amendment and these following remarks, is respectfully requested.

Claims 1 through 3, 5, 6, 8 through 15, 17, 18, and 20 through 26 remain in this case. Claims 1, 10, 12, 13, 22, and 24 through 26 are amended. Claims 4, 7, 16, and 19 are canceled.

Claims 4, 12, 13, 16, 24, and 26 were rejected under §112, ¶1, as containing subject matter for which an enabling description is provided in the specification. Claims 4 and 16 are canceled to advance the prosecution of this case, without prejudice to their presentation in a continuing application.

Claims 12, 24, and 26 were specifically rejected because of the phrase "an alcohol having a general formula of OR<sup>2</sup>". Claims 12, 24, and 26 are all amended to cancel the objectionable phrase, obviating the rejection. Claim 13 was rejected because of the phrase "wherein R<sup>1</sup> and R<sup>2</sup> form a coating"; claim 13 is amended to now recite that the coating is formed in the second reacting step, obviating the rejection.

Claims 12, 24, and 26 were also rejected under §112, ¶1, on the grounds that the specification is enabling only for long chain alcohols, and not for any alcohol. Applicant respectfully traverses this basis of the rejection. The specification clearly provides support for decanol, among other alcohols,<sup>1</sup> which Applicant submits is not a long chain alcohol. For example, at least one commentator defines the generic term 'long-chain alcohol' as referring to an aliphatic compound with a chain-length greater than C<sub>10</sub> that possesses a terminal CH<sub>2</sub>OH group.<sup>2</sup> Since decanol is a C<sub>10</sub> alcohol, decanol is an example of an alcohol that is other than a "long-chain" alcohol, at least according to this definition. Accordingly, Applicant submits that one

<sup>1</sup> Specification of S.N. 10/826,613, page 9, lines 29 through 31; page 10, lines 4 through 6.

<sup>2</sup> Moss, *Nomenclature of Lipids*, (IUPAC-IUB Commission on Biochemical Nomenclature, 1976), available at <http://www.chem.qmul.ac.uk/iupac/lipid/lip1n2.html#r3>, citing International Union of Biochemistry (1966) *Nomenclature of Organic Chemistry (Sections A, B and C)* 2nd edn, Butterworths, London.

skilled in the art, having reference to this specification, would not recognize from the specification that only long-chain alcohols were described as reagents, but rather that the skilled reader would recognize that a wide range of alcohols could be used.<sup>3</sup> Accordingly, Applicant respectfully traverses this basis of the rejection.

Claims 12, 24, and 26 were also rejected, under §112, ¶1, because the specification does not support a method in which the alcohol is not provided in large excess. Applicant also respectfully traverses this basis of the rejection. While Applicant agrees that the cited location of the specification<sup>4</sup> describes an example of the invention in which the alcohol is provided in large excess, Applicant submits that this described example refers to one way in which the reaction is "driven to completion".<sup>5</sup> However, the specification also discloses that the reaction with the exposed reactive group "need not go to completion",<sup>6</sup> and describes an example in which an alcohol reaction leaves unreacted ethoxy groups, but that are left inaccessible to water.<sup>7</sup> Accordingly, because the specification describes at least one example in which the alcohol need not be provided in large excess, because the reaction need not be driven to completion, claims 12, 24, and 26 as written are fully supported by the specification.

Claims 1 through 26 were all rejected under §112, ¶1 as failing to comply with the written description requirement, due to several terms in the specification that were found to not be "well described and or defined".<sup>8</sup>

The Examiner found the passage "a nucleophile of the same general class"<sup>9</sup> to be unclear, as not descriptive of what species would fit into such classes. Applicant respectfully traverses this basis of the rejection. This portion of the specification is stating the Summary of the Invention, and as such its intent is to summarize the scope of the invention as claimed, in light of the Detailed Description. This passage is therefore summarizing the Detailed Description,

<sup>3</sup> See also specification, *supra*, at page 9, lines 21 through 23 ("The ethoxy groups may be reacted with any alcohol, which replaces the ethanol to form a new surface in its place.").

<sup>4</sup> Specification, *supra*, page 8, lines 10 through 20.

<sup>5</sup> *Id.*

<sup>6</sup> Specification, *supra*, page 9, lines 1 through 5.

<sup>7</sup> Specification, *supra*, page 9, lines 6 through 31.

<sup>8</sup> Office Action of August 3, 2005, page 4.

referring to the nucleophile as reacting with and displacing the reactive species, and becoming covalently bound to the species "A" with which the reactive species was previously bound.<sup>10</sup> The skilled reader of the specification would thus understand that "same general class" would mean that the nucleophile, or a reaction product of the nucleophile and the reactive species, would be of the class that would be covalently bound to species "A" as was the reactive species. Applicant therefore respectfully traverses this basis of the rejection.

Another basis of the written description rejection was that the phrase "ternary or [m]ore complicated compounds and their oxides"<sup>11</sup> was unclear, in that the phrase "ternary or more complicated" was unclear, and that the specification was unclear regarding whether the oxides were of any of the listed species or only of the more complicated compounds. Applicant first submits that the phrase "ternary" refers to a compound of three constituent elements, as is clear from the immediately preceding phrase in the specification which describes GaAs and InP as examples of "binary compounds".<sup>12</sup> By extension, therefore, the "more complicated" compounds would refer to compounds of more than three constituent elements. In addition, this phrase in the specification<sup>13</sup> includes a comma before the phrase "and their oxides".<sup>14</sup> As such, the oxides may be oxides of any of the elemental metallic or ceramic species, or the binary or more complicated compounds. Applicant therefore respectfully submits that this passage of the specification would be clear to the skilled reader.

Several passages<sup>15</sup> were cited by the Examiner as containing the parameters *n*, *m*, and *D*, which the Examiner found to be undefined. Applicant traverses this basis of the rejection. The parameters *n* and *m*, as used in the specification, are clearly variable parameters that indicate the number of atoms of a constituent element that are present in a compound. The specific values of parameters *n* and *m* will, of course, depend on the stoichiometry of that particular compound, but the skilled reader will realize that these particular values are, in the general sense, not important

<sup>9</sup> Specification, *supra*, page 5, lines 7 and 8.

<sup>10</sup> Specification, *supra*, page 7, lines 16 through 25.

<sup>11</sup> Specification, *supra*, page 7, lines 29 and 30.

<sup>12</sup> *Id.*

<sup>13</sup> Not as quoted by the Examiner.

<sup>14</sup> *Id.*

to understanding this invention. Similarly, the parameter D clearly refers to a constituent of a compound having the R<sup>2</sup> species bound thereto, such that the R<sup>2</sup> species can then react with and displace the reactive species X, as discussed above. The D constituent does not participate in the reaction, as is evident from the specification. Accordingly, Applicant submits that one skilled in the art having reference to this specification would clearly understand the meaning of the parameters n, m, and D, as written, and respectfully traverses this basis of the rejection.

The Examiner further found the term "dodecadieneol"<sup>16</sup> to be unclear. Applicant submits that this word was misspelled, and submits amendment to the specification to now correctly refer to "dodecadienol", which Applicant submits is a well-known alcohol. No new matter is presented by this amendment to the specification, and Applicant submits that this amendment is sufficient to overcome the rejection on this basis.

The Examiner further found that it was unclear whether the "O" characters above the surface in the Figures are oxygen atoms, and if so, how the oxygen atoms are attached to the surface. Applicant traverses this basis of the rejection. It is readily apparent from the description<sup>17</sup> that the original surface being treated is oxidized. The "O" characters thus clearly refer to the oxygen atoms within such oxide compounds (*i.e.*, the "oxidized" substance). And Applicant respectfully submits that the manner in which oxygen atoms are "attached" in molecules of an oxide compound is a fundamental concept, known by those having the slightest training in chemistry. Applicant therefore respectfully submits that the Figures are not unclear in this regard, and traverses the rejection on this basis.

The Examiner further rejected the claims under §112, ¶1 because passages in the specification<sup>18</sup> referring to "oxide surfaces" were unclear because it was ambiguous whether such "oxide surfaces" were the same or different from a later reference to a surface that was "oxidized".<sup>19</sup> Applicant traverses this basis of the rejection. It is not apparent to the undersigned

<sup>15</sup> Specification, *supra*, page 7, lines 18 through 21; page 9, lines 6 and 7; page 20, lines 6 through 8.

<sup>16</sup> Specification, *supra*, page 9, line 31; page 10, line 6.

<sup>17</sup> Specification, *supra*, page 7, lines 16 through 20.

<sup>18</sup> Specification, *supra*, page 1, line 7; page 5, line 6.

<sup>19</sup> Specification, *supra*, page 5, line 3.

how there can be any confusion about the synonymous nature of these two phrases.<sup>20</sup> The context of the passages on page 5 especially indicates that these two phrases mean one and the same thing. Applicant therefore respectfully submits that the skilled reader would not be confused by the synonymous use of these two phrases, and respectfully traverses the rejection accordingly.

Another basis for the §112, ¶1 rejection was that the phrase "form a new exposed surface"<sup>21</sup> was unclear, because it was not clear to the Examiner what was exposed, or what the exposed groups are in the Figures. Applicant respectfully traverses this basis of the rejection. Especially if one considers the context of the problem addressed by the invention, namely stiction control of oxidized metal or semimetal surfaces,<sup>22</sup> it is apparent to even a casual reader that the original exposed surface is the one that is set out to be coated, and that the "new" exposed surface is that surface after application of the coating. The cited passage itself refers to the reacting of an active species with the oxide surface, which (especially in the context of the Figures) is obviously accomplished by somehow placing that active species in contact with the "exposed" oxide surface. Applicant respectfully submits that this phrase is in no way confusing to the skilled reader, and traverses this basis of the rejection accordingly.

The §112, ¶1 rejection was also based on the Examiner's allegation that the constituent OCH<sub>3</sub> listed as an example of an ester<sup>23</sup> was confusing. The specification at this location is amended to strike the objectionable phrase, on the basis that the term "ester" is well known in the art and needs no additional clarification. No new matter is presented by this amendment, and it is further submitted that this amendment to the specification is sufficient to overcome this basis of the rejection.

And the final basis for the §112, ¶1 rejection was that the Examiner found it unclear how the coating can be considered a monolayer<sup>24</sup> when two separate species, namely the original

<sup>20</sup> See also specification, *supra*, page 2, lines 3 through 6.

<sup>21</sup> Specification, *supra*, page 5, line 7.

<sup>22</sup> Specification, *supra*, page 2, line 24 through page 3, line 4.

<sup>23</sup> Specification, *supra*, page 8, lines 2 through 6.

<sup>24</sup> Specification, *supra*, page 10, line 18 through page 11, line 18.

active species and also the nucleophilic molecule, build the coating in two steps. Applicant respectfully traverses this basis of the rejection, on the grounds that the specification clearly teaches that the nucleophilic molecule "reacts with and displaces the exposed reactive groups",<sup>25</sup> to which the cited objectionable passage clearly refers.<sup>26</sup> Applicant respectfully submits that the specification is clear regarding the formation of the monolayer in these two steps, by displacement of one species with another, and accordingly respectfully traverses this basis of the rejection.

For the foregoing reasons, Applicant submits that the claims in this case are fully supported by a written description, within the requirements of §112, ¶1.

Claims 1 through 26 were all also rejected under §112, ¶2 as indefinite for failing to particularly point out and distinctly claim the subject matter of the invention.

Claims 1, 13, and 25 were all specifically rejected because the phrase "new exposed surface" was unclear. For the reasons discussed above, Applicant submits that this phrase is not unclear. However, to advance the prosecution of this case, each of claims 1, 13, and 25 are amended to cancel the objectionable phrase, replacing it in each case with "to form an exposed surface". Applicant submits that the amendment presented to claims 1, 13, and 25 is in no way narrowing.<sup>27</sup> As discussed above, it is apparent to even a casual reader of the claims, in light of the specification, that the original exposed surface is the one that is set out to be coated, and that the reacting step forms an exposed surface having a reactive group thereat. The specification and Figures clearly teach and illustrate this reacting of an active species with the oxide surface, resulting in an exposed surface that is later reacted with the nucleophilic molecule. Applicant respectfully submits that amended claims 1, 13, and 25 are sufficiently definite to the skilled reader, and that these claims and their dependent claims are sufficiently definite in this regard to meet the requirements of §112, ¶2.

<sup>25</sup> Specification, *supra*, page 7, lines 22 through 25.

<sup>26</sup> Specification, *supra*, page 11, lines 2 and 3 ("After the reaction, a single monolayer results . . .", *emphasis added*).

<sup>27</sup> See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 535 U.S. 722, 62 USPQ2d 1705 (2002), *on remand*, 304 F.3d 1289, 64 USPQ2d 1698 (Fed. Cir. 2002).

Claims 1, 13, and 25 were also rejected under §112, ¶2 because of the phrase "same chemical class". To advance the prosecution of this case, each of these claims is amended to cancel the objectionable phrase, obviating this basis of the rejection.

Claims 1, 13, and 25 were further rejected under §112 as indefinite because of the inclusion of the placeholder D, which was found to not be defined. Applicant respectfully traverses the rejection on this basis, on the grounds that one skilled in the art would recognize from the claim, and especially in light of the specification, that the placeholder D in the general formulae corresponds to the substituent with which substituent R<sup>2</sup> is chemically combined to form the nucleophilic molecule. It is unnecessary to define constituent D for purposes of this invention, and Applicant submits that the skilled reader would readily comprehend that fact regarding these claims. Accordingly, Applicant respectfully submits that amended claims 1, 13, and 25 are sufficiently definite to meet the requirements of §112, ¶2, despite including the "D" constituent, and respectfully traverses the rejection on this basis.

Claims 5 and 17 were rejected under §112, ¶2 as indefinite because it is unclear, to the Examiner, as to how the coating can be considered a monolayer. As discussed above relative to the §112, ¶1 rejection, the specification clearly teaches that the nucleophilic molecule "reacts with and displaces the exposed reactive groups".<sup>28</sup> Therefore, the second reacting step of claims 5 and 17 (presented in their respective independent claims 1 and 13) does not form a second layer but rather provides the constituent that displaces the reactive group within the original layer. Applicant therefore respectfully submits that claims 5 and 7 are not unclear, and respectfully traverses the §112, ¶2 rejection of these claims.

Claims 7, 9, 19, and 21 were rejected under §112, ¶2 because the "such as" phrase rendered the claims indefinite; claims 7 and 19 were also rejected for additional reasons. To advance the prosecution of this case, these claims are canceled, without prejudice to their presentation in a continuing application.

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<sup>28</sup> Specification, *supra*, page 7, lines 22 through 25.

Claims 12 and 24 were rejected under §112, ¶2 as indefinite because the TEOS recited in those claims does not belong to the species of claims 8 and 20. Applicants traverse the rejection, on the grounds that claim 12 does not depend on claim 8, and claim 24 does not depend on claim 20. Accordingly, it is not in any way relevant to the clarity of claims 12 and 24 whether TEOS is or is not a member of one of the species recited in claims 8 and 20. There is in fact no indefiniteness in claims 12 and 24, and Applicant respectfully traverses the rejection accordingly.

Claims 4 and 16 were rejected under §112, ¶2 as indefinite. Claims 4 and 16 are canceled, to advance the prosecution of this case, without prejudice to their presentation in a continuing application.

Claims 12, 24, and 26 were rejected under §112, ¶2 as indefinite because of the recited formula of "OR<sup>2</sup>". As discussed above, these claims are amended to cancel the objectionable phrase, obviating the rejection of these claims.

Claims 10 and 22 were rejected under §112, ¶2 as indefinite because the term "normal" was not defined. Claims 10 and 22 are each amended to overcome the rejection, by now reciting that the reacting step is at a temperature above an environmental temperature to which the coating is expected to be exposed in later processing. The specification clearly supports this amendment to the claims,<sup>29</sup> and therefore no new matter is presented. Applicant submits that claims 10 and 22 are now in sufficiently definite form to meet the requirements of §112, ¶2.

Claims 1 through 26 were rejected under §102 as anticipated by the Ogawa et al. reference.<sup>30</sup> The Examiner asserted that the reference teaches the applying of TEOS or other alkoxy silanes to substrates such as glass, metal and ceramics,<sup>31</sup> and that the trimethoxy groups inherently hydrolyze to an alcohol, and react with the TEOS on the substrate to form a water

<sup>29</sup> Specification, *supra*, page 8, lines 24 through 31.

<sup>30</sup> U.S. Patent Publication No. 2001/0031364, published October 18, 2001, on an application by Ogawa et al. filed March 29, 2001.

<sup>31</sup> Ogawa et al, *supra*, paragraphs [0082] and [0084].

repellent fluorine-containing coating.<sup>32</sup> Specific features of dependent claims 10 and 22 were found in the reference.

Applicant respectfully submits that amended claim 1 is novel and patentably distinct over the Ogawa et al. reference, because the reference does not meet the requirements of the claim, particularly the second reacting step.

Nowhere does the Ogawa et al. reference disclose the reacting of a nucleophilic molecule with a reactive group at an exposed surface following the first reacting step, to form a bond between the nucleophilic molecule and constituent A of the active species. Referring to the location of the reference cited by the Examiner as teaching the second reacting step,<sup>33</sup> it is apparent that there is no reacting of the fluoroalkyl trimethoxy silane compound with a reactive group then at the surface, so that a nucleophilic molecule in this compound forms a bond with a constituent A at the surface. A full reading of paragraphs [0145] and [0146], within the context of the reference, clearly indicates that the fluoroalkyl trimethoxy silane compound is applied in a methanol solvent, and after evaporation of that solvent, forms a "coating film made of a fluoroalkyl trimethoxy silane compound".<sup>34</sup> In other words, the Ogawa et al. reference teaches that a second film is formed over a first film.<sup>35</sup> Indeed, claim 30 of the Ogawa et al. reference clearly refers to the structure of a fluorine-containing coating film, and a silica-based coating film interposed between the substrate and the fluorine-containing coating film.<sup>36</sup>

Secondly, Applicant disputes the assertion by the Examiner that the trimethoxy groups inherently hydrolyze to an alcohol. While Applicant understands that there is no disclosure in the Ogawa et al. reference alleged as expressly teaching this mechanism, the Examiner has presented no factual basis for this inherent hydrolysis. To the extent that this finding of inherency serves as a basis for the §102 rejection, Applicant submits that the rejection is unfounded and in error.

<sup>32</sup> *Id.*, paragraphs [0136] and [0153].

<sup>33</sup> *Id.*, paragraph [0145].

<sup>34</sup> *Id.*, paragraph [0146].

<sup>35</sup> See also Ogawa et al., *supra*, paragraph [0079].

<sup>36</sup> *Id.*, claim 30.

Because each of the claims in this case require the reacting of a nucleophilic molecule having a general formula of  $DR^2$  with a reactive group to form a bond between the nucleophilic molecule and A (claims 1 through 24) or Si (claims 25 and 26), Applicant respectfully submits that the Ogawa et al. reference falls short of the requirements of these claims. Applicant therefore submits that all of the claims in this case are therefore novel over the Ogawa et al. reference.

The Examiner also rejected each of claims 1 through 26 in this case under §102 as anticipated by the Europe '740 reference.<sup>37</sup> The Examiner asserted that the reference teaches the applying of TEOS or other alkoxy silanes to substrates, followed by the application of a fluoroalkyl trimethoxysilane.<sup>38</sup> The Examiner further asserted that the trimethoxy groups inherently hydrolyze to an alcohol, and that the heating of the coating also meets the limitations of claims 10 and 22.

Applicant respectfully submits that the claims in this case are novel over Europe '740. As in the case of the Ogawa et al. reference, the Examiner does not assert that the reference teaches, and the reference in fact does not teach, the reacting of a nucleophilic molecule having a general formula of  $DR^2$  with a reactive group to form a bond between the nucleophilic molecule and a constituent A (claims 1 through 24) or Si (claims 25 and 26). As in the Ogawa et al. reference, this reference also discloses the applying of a second coat over a first film, with no disclosed reacting between the alleged nucleophilic molecule and a constituent A (e.g., Si) from the first reacting. The absence of this reacting is especially evident from Figure 1 of Europe '740, in which the second coating step (b) adds an additional layer including silicon atoms, with no illustrated bond between any alleged nucleophilic molecule and an underlying silicon atom, for example, from the first coating step (a). Accordingly, Applicant submits that the teachings of Europe '740 fall short of the requirements of each of the claims in this case.

Secondly, as discussed above relative to the Ogawa et al. reference, Applicant disputes the assertion by the Examiner that the trimethoxy groups inherently hydrolyze to an alcohol.

<sup>37</sup> European Patent Publication EP 1 153 740 A1, published November 14, 2001.

<sup>38</sup> '740, *supra*, paragraphs [0089], [0104], [0130].

The Examiner has presented no factual basis for this inherent hydrolysis. To the extent that this finding of inherency serves as a basis for the §102 rejection, Applicant submits that the rejection is unfounded and in error.

For these reasons, Applicant respectfully submits that Europe '740 falls short of the requirements of these claims. Applicant therefore submits that all of the claims in this case are therefore novel over that reference also.

Applicant further submits that the claims in this case are not only novel, but are patentably distinct over the prior art in this case. In particular, as clearly described in the specification,<sup>39</sup> this invention provides the important advantages of a single monolayer that is very regular, and hydrophobic, such that water is prevented from adhering to the small surface. Intermolecular forces from this water, and also the effects of van der Waals, dipole, or capillary forces, are thus prevented from effecting very small moving elements, such as the micromachined device as a digital micromirror. These important benefits stem directly from the difference between the claims and the prior art in this case, and strongly illustrate the patentability of these claims.

The prior art cited as pertinent but not applied has been considered but is not felt to come within the scope of the claims in this case.

The specification is also amended to correct the typographical error noted by the Examiner.

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<sup>39</sup> Specification, *supra*, page 11, lines 2 through 10; page 12, line 25 through page 13, line 2.

For the above reasons, Applicant respectfully submits that all claims now in this case are in condition for allowance. Reconsideration of the above-referenced application is therefore respectfully requested.

Respectfully submitted,



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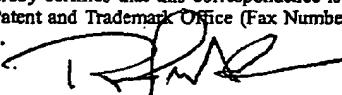
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37 C.F.R. 1.8

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